

WHAT IS CLAIMED IS:

1. A method for implanting a radially expandable prosthesis in a body lumen, said method comprising:

5 expanding at least one scaffold of the prosthesis at an implantation site within the body lumen; and

introducing a plurality of fasteners through the prosthesis in the region of the scaffold to anchor the scaffold in place.

2. A method as in claim 1, wherein the scaffold is elastic and expanding comprises releasing the scaffold from constraint to permit the scaffold to self expand at the implantation site.

15 3. A method as in claim 1, wherein the scaffold is malleable and expanding comprises applying a radially expansive force within the scaffold to cause expansion.

4. A method as in claim 1, wherein expanding comprises expanding at least to scaffolds at spaced apart locations on the prosthesis

5. A method as in claim 1, wherein expanding comprises expanding at least three spaced apart prostheses on the prosthesis.

25 6. A method as in claim 1, wherein expanding comprises expanding a scaffold structure that spans the entire length of the prosthesis.

7. A method as in claim 1, wherein the prosthesis comprises a fabric covering at least a portion of the scaffold, wherein introducing comprises introducing at least some of the fasteners through the fabric but not through the scaffold.

35 8. A method as in claim 1, wherein the prosthesis comprises a fabric covering at least a portion of the scaffold, wherein introducing comprises

introducing at least some of the fasteners over elements of the scaffold.

9. A method as in claim 1, wherein the fasteners are helical penetrating fasteners.

5 10. A method as in claim 9, wherein the introducing step comprises introducing single fasteners in a circumferentially spaced-apart pillar on the inner wall of the prosthesis.

10 11. A method as in claim 10, wherein introducing comprises introducing from two to 12 helical fasteners at each region where the fasteners are placed.

X 12. An intraluminal fastener applier comprising:

15 a tubular body with a deflectable distal end;
a stabilizer configured to engage a blood vessel wall to hold the distal end of tubular body in place;

20 a control handle at a proximal end of the tubular body having controls to separately deflect the distal end, and deploy the stabilizer that holds the deflected distal end in place;

and means to advance a fastener from the distal end into the blood vessel wall engaged by the distal end.

25 X 13. An intraluminal fastener applier as in claim 12, wherein the fastener advancing means comprises a fastener delivery device which is introducable through the tubular body and which carries at least one fastener.

30 X 14. An intraluminal fastener applier as in claim 13, wherein the fastener delivery device comprises a flexible shaft which carries a single helical fastener at its distal end and a means for rotating and advancing the helical fastener to penetrate tissue.

X 15. An intraluminal fastener as in claim 14,
35 wherein the flexible shaft has a helical track which

carries the helical fastener and a rotator wire that engages and rotates the helical fastener to cause advancement from the distal end of the body.

16. A method for implanting a radially
5 expandable prosthesis at a target site in a body lumen, said method comprising:

advancing a guidewire from a remote access site to the target site;

10 introducing a prosthesis deployment catheter over the guidewire to the target site;

deploying the prosthesis from the deployment catheter at the target site;

exchanging the deployment catheter for an intraluminal fastener applier over the guidewire; and

15 introducing from the intraluminal fastener applier a plurality of fasteners through the prosthesis to anchor the prosthesis.

17. A method as in claim 16, wherein the prosthesis is self-expanding and deploying comprises
20 releasing the prosthesis from constraint to permit the prosthesis to self-expand at the target site.

18. A method as in claim 16, wherein the prosthesis is malleable and expanding comprises applying a radially expansive force within the prosthesis to cause
25 expansion.

19. A method as in claim 16, wherein a single fastener is applied from the intraluminal fastener applier and the applier is withdrawn from the vasculature and a new fastener loaded on the catheter before
30 returning the applier to the target location.